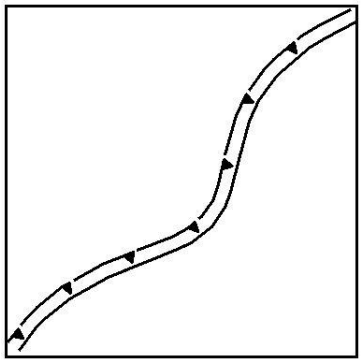
SC-9 SEDIMENT/ DESILTING BASIN

Refer to: ITD Standard Specifications, Section 212.
ITD Standard Drawings P-1-C, P-1-D, and P-4-A.



Standard Symbol

BMP Objectives

- ☐ **Perimeter Control**
- ☐ **Slope Protection**
- ☐ **Borrow and Stockpiles**
- ☒ **Drainage Areas**
- ☒ **Sediment Trapping**
- ☒ **Stream Protection**
- ☐ **Temporary Stabilizing**
- ☐ **Permanent Stabilizing**

Definition and Purpose

Sediment/desilting basins are one of the most effective sediment control measures. A sediment/desilting basin is a temporary basin formed by excavating and/or constructing an embankment so that sediment-laden runoff is temporarily detained under quiescent conditions, allowing sediment to settle out before the runoff is discharged.

Appropriate Applications

Sediment basins may be appropriate in the following applications:

- At the toe of slopes or embankments where slope drains discharge.
- At the lower end of waste areas or borrow pits.
- At the outlet of perimeter controls.
- At the outlet of any structure discharging sediment-laden runoff.
- Upstream to an inlet, or channel ditch check dam.
- Upstream to the outlet of a staging or storage area.
- One or a series of small basins constructed along a concentrated runoff flow path.

Limitations

- May not be feasible in narrow rights-of-way or limited areas due to lack of space.

- Normally collect only sand-sized or larger particles, with fine clay-sized particles passing through. Because finer silts or clays may not settle out, additional erosion control measures may be constructed downstream to minimize sediment release.
- Require large surface areas to permit infiltration and settling of sediment.
- May not be applicable in highly permeable soils.
- Cannot be used in active stream channels.
- May be a drowning hazard and protective fencing may be required.

Design Parameters

- Design of the sediment basin should be based upon the total area being drained. Consideration needs to be given to the volume of sediment, the percent of sediment load to be removed, particle size, and estimated peak rates of runoff.
- Sediment basin efficiency, in respect to design of the size (volume) of the basin and sediment recovery, should be based on an assessment of potential downstream impact. Runoff should enter the basins as far from the outlet as possible to maximize retention time.
- The volume of small sediment basins that are installed upstream of a ditch or channel check dam and outlet or inlet structures is based more on the availability of space to excavate and maintain the basin.
- The volume of larger sediment basins requires more evaluation and calculation. The recovery and deposit of sediment particles in a sediment basin is a function of the fall velocity (sedimentation rate) of the particles, the basin length and width, and the discharge per meter of basin width.
- The volume of a sediment trap basin should be at least 1,800 cubic feet per acre of total drainage area (0.5 inches over the watershed) for areas less than 10 acres. Disturbed areas greater than 10 acres within the same drainage basin should have a basin with a capacity of 250 cubic meters per hectare of total drainage area 3,600 cubic feet per acre drained 1 inch over the watershed to meet the NPDES regulations.
- The basin may be designed to include baffles (berms) or other deflectors, such as floating sediment barriers, to spread and reduce the velocity of water flow throughout the basin. An emergency spillway must be included in the basin, in case the overflow is plugged for some reason. The emergency spillway structures will be designed on a site-specific basis.

Installation

- Locate and construct temporary sediment basin as early as possible in the construction phase, especially after installation of other BMPs, such as slope drains, ditch check dams, or outlets and inlets.
- Clear existing vegetation and other debris if present in the basin construction area
- Construct the sediment basin in an area where there is sufficient room and topography to allow for access and clean-out of the basin.

- The banks or slope of the sediment basin may require that geosynthetic liner or jute matting be installed to protect against erosion. Care must be taken not to disturb the liners or matting during clean out of the basin. A temporary soil stabilization or erosion control surface application may be used to stabilize the surrounding area.
- If berms or dikes with appropriate outlets are constructed, care must be taken to assure proper compaction as specified.

Maintenance and Inspection

- Conduct inspections as required by the NPDES permit or contract specifications.
- Keep the sediment trap basin operational and maintained until the drainage area is permanently stabilized.
- Make necessary repairs to ensure the basin is operational and performing properly.